

NAI Focus Group

NASA ASTROBIOLOGY INSTITUTE

Jack Farmer, Chair
Department of Geological Sciences
Arizona State University
Tempe, AZ
jfarmer@asu.edu

The Mars Focus Group was chartered to provide a forum within the NAI for discussing the scientific goals, objectives, and measurement requirements for ongoing and future Mars missions involved with the exploration for past or present Martian life, and/or pre-biotic chemistry. The products of this focus group are basic science recommendations and advice on implementation of astrobiology missions provided to mission planning groups.

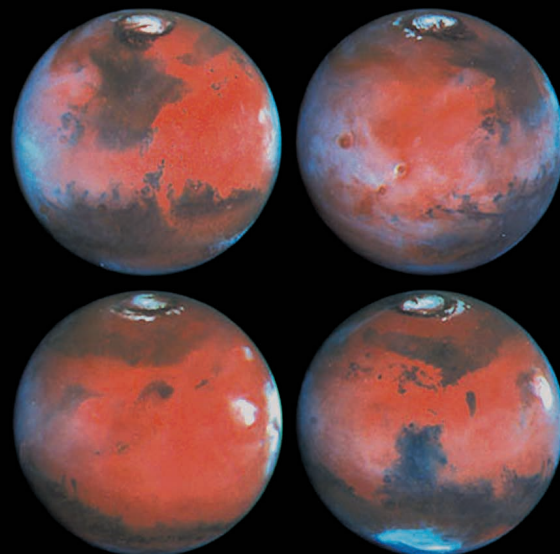
Recent Activities

During the past year the primary aim of the Mars Focus Group (MFG) has been to develop landing site recommendations for presentation to mission planners for the 2003 Mars lander mission. Two NAI-wide videocons were presented (January 8 & 16, 2001) which: 1) reviewed the 2003 mission architecture, science payload, and engineering/landing site constraints, 2) discussed potential landing sites with a high priority for astrobiology and which could meet first order engineering constraints, and 3) sought a consensus recommendation from the NAI regarding science and site priorities for the 2003 mission. NAI Mars Focus Group discussions were made available to the entire Institute, but also included targeted invitees from outside of the NAI to broaden its base of expertise. Site reviews were presented by members of the ASU team (Farmer, Greeley, Hamilton, Nelson), and two members (Cabrol and Gulick) outside of the NAI who represented the Center for Mars Exploration (CMEX) at the NASA Ames Research Center. Presenta-

tions were followed by open discussions organized around several high-level questions that dealt with science and mission priorities for the 2003 mission. Presentation materials and a summary of the discussion were archived on the ASU Astrobiology and CMEX web sites. Results of the landing site discussions were presented by the MFG Chair at a Landing Sites Workshop held at NASA Ames at the end of January, 2001. Based on input from that Workshop, the 2003 Landing Sites Steering Committee (headed by John Grant of NASA Headquarters) developed a shortlist of approximately 10 sites (from ~40 presented by the community at the workshop) for additional engineering studies and targeted high resolution imaging by the Mars Orbiter Camera now in Mars orbit. About half of the sites shortlisted were on the NAI MFG list of recommendations.

The Mars Focus Group also organized a breakout session in conjunction with the Year 2001 General Meeting of the NAI held at the Carnegie Institution of Washington in April. The

Hubble Space Telescope (HST) image of four different views of the planet Mars during summer season in the Northern Hemisphere.



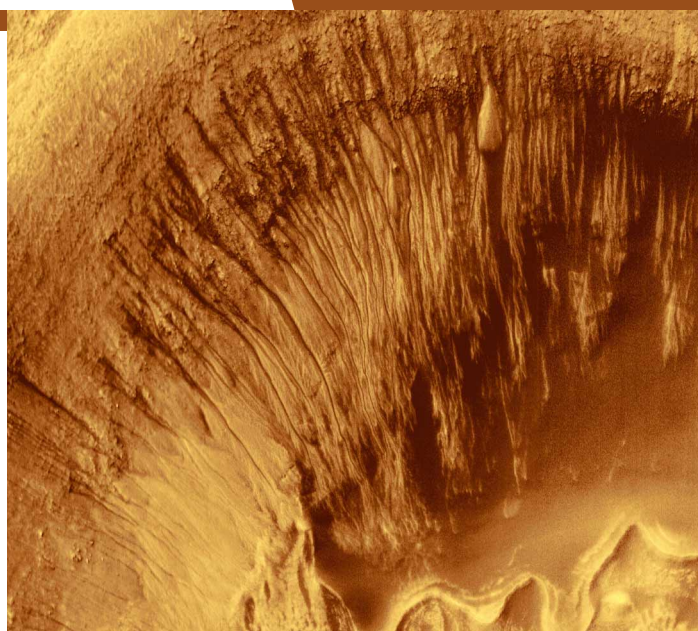
group met, under standing room only conditions, to review the results of the Landing Site Workshop and to discuss future directions. One new goal identified was to broaden the scope of the group's present activities, which are primarily directed towards the development of future space missions, to include a basic research component. Several potential directions for basic research initiatives were proposed at the meeting, including the areas of life detection and technology development for astrobiology.

Mission Recommendations

Among the highest rated landing sites now shortlisted for the 2003 mission is the so-called hematite site at Terra Meridiani. This site has been given high priority by the NAI MFG because of the potential for sampling aqueous sedimentary deposits of importance in the search for fossil biosignatures.

On the basis of recommendations presented by the NAI MFG, the southern latitudinal limit for the 2003 mission has been extended several degrees to accommodate a site in Gusev Crater identified as having a high priority for astrobiology research.

Channeled Aprons on the surface of Mars are possible evidence of recent water. Photo Credit: NASA/JPL/Malin Space Science Systems.



Near-term objectives of the NAI Mars Focus Group include efforts to review the existing plans for: 1) the 2005 Mars mission, including the recommendations of the '05 Science Definition Team (which includes several NAI members), 2) the summary of recent Mars Exploration Payload Advisory (MEPAG) activities, and 3) the upcoming instrumentation workshop.

This group is also exploring opportunities to develop a summer institute focused on Mars astrobiology. This new program would be aimed primarily at education and cross-training to develop a shared experience base among individual NAI investigators and students to enhance interactions between MFG members from different disciplines and to strengthen overall NAI participation in missions.

This image, acquired by the Mars Global Surveyor's (MGS) Mars Orbiter Camera (MOC) in May 2000, shows the numerous gullies on the surface of Mars. Photo Credit: NASA/JPL/Malin Space Science Systems.

